THE RARS -EXCITER-

RALEIGH AMATEUR RADIO SOCIETY — WORLDWIDE FRIENDSHIP

CLUB CALL: W4DW — REPEATER: W4DW/R 146.04/64

ISSUE 216 — MARCH, 1988

LEADING EDGE

SHERMAN STARNES
W4TZU

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OSCAR-10 was expected to be useable until the end of February but the solar cell illumination became so poor that operations had to be stopped early in the month. I don't know if this signifies a decrease in the potential usefulness of the satellite or not. My HF transceiver vacationed in Dallas so I wasn't able to get on the uplink, but listening on two meters, I knew that the satellite was dead or that my tracking programs had gone awry. AA4MY passed the news of the problem along to me from an ARRL bulletin.

WØRPK in central Iowa is has established a robot six-meter packet station to be operated during several operating events during 1988. It was on during the VHF Sweepstakes in January but I don't have any results yet. It will be on during the June and September VHF operating events sponsored by the ARRL. The station runs 160 watts to a five-element beam. It is packaged for portability and will be placed in operation in various grid squares. It is accessed by sending continuous CONNECT REQUEST packets. When the robot detects a request, it returns a single packet, containing connect acknowledgement, a QSO serial number and a DISCONNECT REQUEST. It continues to send the DISCONNECT REQUEST until it detects a DISCONNECT REQUEST ACKNOWLEDGEMENT. The robot can handle up to ten simultaneous QSOs and periodically sends packets listing stations heard and stations worked. It runs a software package developed for a future ham-in-space operation. During the summer, single-hop contacts should be possible from here for those of you on six-meter packet. The frequency used in January was 50.505 MHz. I suppose that is a common frequency such as the ones used on two meters. You can get more information and updates from Ralph via packet radio @ WAØJFS-1 via the NØAN HF gateway.

The Project SKITREK will commence sometime in March and, as I indicated earlier, the position of the Russian-Canadian team will be available via the synthesized voice facilities of UOSAT-OSCAR-11. The speech is based on the National Semiconductor DIGI-TALKER integrated circuit. I printed out information for local passes for the month of March but since it came to four pages it has been pared down to week-end passes only. That listing appears elsewhere in this issue. As indicated in the instructions, you can hear the satellite with an HT on 145.825 when it gets well above the horizon. If you have a multi-mode two meter radio or other facility for tuning in one KHz steps, you will hear the beacon about three KHz higher early in the pass.

EDITOR: Vince Yakamavich, AA4MY - 220 Carriage Tr., Raleigh 27614 - 847-8512

MINUTES OF THE MEETING

The regular monthly meeting of The Raleigh Amateur Radio Society was held Feb. 3, 1988 at the First Presbyterian Church, on S. Salisbury St. President Pete Thacher, N4HQZ, welcomed the 67 members and 7 guests.

The first item of business was a recommendation from the Board at their Jan. meeting. The Board recommended expenditures up to $400 to put together headsets and a tape deck to be used for CW testing (VE & hamfest). Research was persued by K4MC and KB4LAF. The motion was made and passed to go ahead with the project.

Public Service Director, Ardie, N4OIC, thanked all who gave support in the previous events and ensured the group of events to come in '88.

Training Director, Jim, N4BYO, asked for help advertising the upcoming training classes by circulating the flyers he prepared.

VE Coordinator, Vince, AA4MY, reminded the group that the next RARS sponsored exam will be given at our hamfest in April.

In the absence of the FM Comm. Chair. Ron, WA4MJF, updated the members about the status of the 220 repeater. The CW ID needs to be changed, but other than that, it is ready to go.

2M Net Chair., Jim, K4ABJ, needs substitute net control stations. 10M Net Chair., Rob, AB4FY, also expressed the need for back up net control stations.

Special Events Chair., Walter, AB4DQ, needs people to operate the W2OODW call from their home next November.

Hamfest Chair., Bruce, WA9NEW, said there are still choice open slots for helpers. Ticket Chair., Tom, N4IZE, needs people to sell tickets at the door. He passed a sign up sheet around. Clean-Up Chair., Ardie, N4OIC, is forming a crew to clean up after the event. Chuk, KB4MDZ, is handling tables and needs people to set them up Sat. afternoon, and sell to vendors on Sun. morning.

Field Day Chair., Bob, NA4G, reported on his progress. The following subcommittees have been formed: Site Publicity: Walter, AB4DQ; Grounds and Antenna's: Steve, AB4EL; Generators: John, KK4JB. Suggestions for a new site are welcome. Bob polled the group as to what is the mission of field day. The results: fraternal, 100 w range transmitters, and set up on all bands. Join the fun June 25th & 26th.

Vice President, Chuk Gleason, KB4MDZ, told the members about the upcoming Club Banquet to be held on March 3rd. Cost will be $7.00 per person. Please sign up by Feb 24th if you plan to attend.

Chuk then introduced the speaker Doug Kepler, from the SBI Div. of Criminal Information who gave an interesting talk. After the program a prize was drawn. There being no further business, the meeting adjourned.

Sue Meyer Parks
WB4USX
RARS Secretary

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WELCOME NEW MEMBERS!!

--	Sandy Coats (YL)	Raleigh
--	Thomas Jeffries,	Raleigh
W2AC	Harry Greenberg,	Clayton
WA4VSL	Glenn Lampley,	Roxboro
WB4QHA	Robert O'Neal	Wake Forest
N4QZO	Warren Bell	(new call)
N4OZL	John Callery	(new call)
AB4FY	Rob Ingrham	(new call)

On behalf of all of RARS (and we're now 229 strong!!), allow me to wish you all a hearty welcome. The best way we know of to enjoy the fellowship RARS has to offer is to become active in the club's many activities. Again, "WELCOME!"

HAMFEST FUSS

It's getting close folks! Better call the Chairman of your choice or expect a call from them! You've heard about early birds and worms, but some worms are better than others. The ad is in the Feb. issue of the Journal and the flyers are done, TNX K4HF. N4IZE got the tickets and NF4P is busy shipping out the pre-registered. The vendor's letter should be out by the time this Exciter gets to you. The labels will be ready for the 'affixng' party Mon. the 29th, 7:30 PM, at the Southern RR office. COME ON DOWN !! April issues of the ham mags will have our Hamfest announcement. Current chairs follow:

CLEAN-UP:	N4OIC
CLUB TABLE:	
CW CONTEST:	K4MC
EXAMS:	AA4MY
FACILITIES:	WA4AOO
FAIRGROUNDS:	K4HF
HOMEBREW:	WA9SZL
HOSPITALITY:	WA4APK/YLRARS
LADIES/KIDS ROOM:	WA4APK
LAYOUT/TABLES:	KB4MDZ
PRE-REGISTRATION:	NF4P
PRIZES:	K4HF
PUBLICITY:	K4HF/WB4ZSM
RARS BOOTH:	
ROOM SCHEDULE:	K4HF
SECURITY:	WA4MJF
STAGE:	WA9NEW
TALK-IN:	KB4ZZY
TICKETS:	N4IZE
VENDORS:	N4IZE
WOUFF HONG:	KK4JB/KC4CPC

A lot of behind the scenes work has already been done and is being done every day. But there's a whole LOT left to do. Somebody Else can't do it all, YOU have do SOME of it. See you at the Banquet, and so will the chairs of these committees. If you haven't already signed up, be ready.

VE REPORT

IS NOVICE ENHANCEMENT WORKING?

"It all depends on who you are talking to. The fact of the matter is that ALL of the increase in new Novice operators is accounted for by one month, May, 1987, when 6,797 new amateurs were issued new ham tickets for the first time (6,406 were issued Novice licenses).

Novice Enhancement was designed to revitalize the Amateur Radio Service and took effect on March 21, 1987. The April and May 1987 licensing statistics were up dramatically (more than 150%) over the previous year. Many thought a boom in ham radio was upon us. Apparently that is not the case. The balance of 1987 saw 15% LESS new amateurs entering the Service than the previous year.

It now appears that applicants were trying to enter the ham ranks before the Novice rules changed. The Novice Element 2 question pool increased by more than 100 questions and became more difficult after March 21st.

All of the April/May (1987) increase in new amateur licenses issued represents applicants that took the old Element 2 written examination before it was revised to cover the new privileges. Applicants apparently wanted the new privileges - but without taking the new examination. Since then, Novice growth has declined and ham growth is in the doldrums again." (quotes from W5YI report)

That report was based on statistics released by the FCC recently, with a month by month, state by state comparison of the numbers of Novice licensees versus the total number of hams. Stats for NC showed:

1985		1986		1987	
Novice	Total	Novice	Total	Novice	Total
1431	8377	1458	8650	1454	9073

VE REPORT (contd.)

National stats:

1985	1986	1987
Novice/Total	Novice/Total	Novice/Total
78616/415856	79882/419762	83013/433389

INCREASE IN TOTAL AMATEUR CENSUS

0.88%	0.94%	3.25%

NOVICE PERCENTAGE TO TOTAL AMATEURS

18.91%	19.03%	19.15%

It's clear the amateur ranks are growing -- but is Novice Enhancement why? What do you think??!!

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RARS VE'S, TAKE NOTE:

Being ARRL certified VE's makes us part of the ARRL Field Organization. As such we are 'authorized' to purchase "official" ARRL name badges, tan in color, from the League's approved sources. Prices range from $4 to $7 for the identical badge (?), and our official request must be approved by the Section Manager. Anyone interested, contact AA4MY or Richard Palm, K1CE, at HQ.

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Two observations on some questionable use of W4DW's autopatch:

The 911 service is meant for reporting situations where there is an imminent danger of loss of life, injury to person or property, or a crime -- ie. an EMERGENCY. Just remember, when you identify yourself as a "Hamwatch Operator" you are representing ALL of ham radio to the local authorities. Please make your impression a positive, PROFESSIONAL one.

Secondly -- use of the autopatch to call a business associate to inform him of one's lateness for an appointment, or whatever. Conducting business over the radio is a definite no-no. It's ILLEGAL! Please, use a phone to conduct your business, not THE CLUB's autopatch!

CLIPPINGS FROM THE EDITOR'S DESK

A tip of the hat to Ann Bradley, WA4APK, and her most charming mom, Maude, for driving all the way from Apex to the north end of the county to help with last month's fold staple & mutilate party. Anthony, WD2AJJ, (a new RARS member) also assisted, as did my lovely XYL, Joyce, WB7TXO (good brownies, but hopefully next month she'll bake chocolate chips!!) THANKS TO ALL FOR HELPING!

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This month's centerfold comes courtesy the ARRL. Each month, I've tried to insert a little "goodie" into the EXCITER that would appeal to the diversified interests of our members. This month's item is the ARRL DXCC countries list, which includes a "check off" area for tracking your 5 Band DXCC. To all you DX "hounds," good hunting!! (And if you have an operating aid you think would be of value to our membership, please let me know. Just remember what the centerfold did for the popularity of Hugh Hefner!) -- 73 de AA4MY

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RARS IN C6A!!

Ron, AA4VK, will operate from the Bahamas signing AA4VK/C6A beginning March 24th and during the CQ WORLD WIDE WPX Phone Contest on March 26 and 27. Ron will operate 80 - 10 meters, primary frequencies of 3760, 7060, 14260, 21360, and 28460. The short propagation distance and 100 watt legal limit will present a challenge.

We realize it's a dirty job, traveling to exotic tropical islands, stringing antennas between the palm trees, operating from a gently swaying hammock and being at the bottom of a DX pile-up; all while fending off scantily clad native girls bearing Mai-Tai's. But somebody's gotta do it!! I wonder if Ron could use someone to carry his bags.... Best of luck in the contest Ron!

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CALL SIGNS ISSUED AS OF JAN 1:

EXTRA	ADV	TECH/GEN	NOVICE
AB4FO	KK4VV	N4RVG	KC4CXJ

(tnx Worlradio)

What is Electricity, and, Where does it go after it leaves the Toaster ?

Here is a simple experiment which will teach you an important electrical lesson: on a cool, dry day scuff your feet along a carpet, then reach your hand into a friend's mouth and touch one of his dental fillings. Did you notice how your former friend twitched violently and cried out in pain?

This teaches us that electricity can be a very powerful force but we must never use it to hurt others unless we need to learn an important lesson about electricity.

It also teaches us how an electrical circuit works. When you scuffed your feet, you picked up batches of "electrons", which are very small objects that carpet manufacturers weave into carpets so they will attract dirt. The electrons travel through your bloodstream and collect in your finger where they form a spark that leaps to your friend's filling, then travel down to his feet and back into the carpet, thus completing the circuit.

If you scuffed your feet long enough without touching anything, you would build up so many electrons that your finger could explode! But this is nothing to worry about unless you have carpeting.

Although we modern persons tend to take our electric lights, radios, mixers, etc. for granted, hundreds of years ago people did not have any of these things, which is just as well because there was no place to plug them in.

Then came the first electrical pioneer, Benjamin Franklin, who flew a kite in a lightning storm and received a serious electrical shock. This proved that lightning was powered by the same force as carpets, but it also damaged Franklin's brain so severely that he started speaking in incomprehensible maxims, such as, "A penny saved is a penny earned". Eventually he had to be given a job running the post office.

After Franklin came a herd of electrical pioneers whose names have become a part of our electrical terminology: Myron Volt, Mary Louise Amp, James Watt, Bob Transformer, etc. These pioneers conducted many important electrical experiments. Among them Galvani discovered that when he attached two different kinds of metal to the leg of a frog, an electrical current developed and the frog's legs kicked, even though it was no longer attached to the frog, which was dead anyway. Galvani's discovery led to enormous advances in the field of amphibian medicine. Today skilled veterinary surgeons can take a frog that has been seriously injured or killed, implant pieces of metal in its muscles, and watch it hop back into the pond just like a normal frog, except for the fact that it sinks like a rock.

But the greatest electrical pioneer of them all was Thomas Edison, who was a brilliant inventor despite the fact that he had little formal education and lived in New Jersey. Edison's first major invention in 1877 was the phonograph, which could be found in thousands of American homes, where it basically sat until 1923, when the record was invented.

But Edison's greatest achievement came in 1879 when he invented the electric company. Edison's design was a brilliant adaptation of the simple electrical circuit: the electric company sends electricity through a wire to a customer, then immediately gets the electricity back through another wire, then, (this is the brilliant part) sends it right back to the customer again.

This means that an electric company can sell a customer the same batch of electricity thousands of times a day and never get caught, since very few customers take the time to examine their electricity very closely. In fact, the last year that any new electricity was generated was 1937. The electric companies have merely re-selling it ever since, which is why they have so much free time to apply for rate increases.

Today, thanks to men like Edison and

Electricity (contd.)

Franklin, and frogs like Galvani's, we receive almost unlimited benefits from electricity. In the past decade scientists developed the laser, an electronic appliance so powerful that it can vaporize a bulldozer 2000 yards away, yet so precise that doctors can use it to perform delicate operations to the human eyeball, provided they remember to change the power setting from "Vaporize bulldozer" to "Delicate."

Courtesy of W4BIW & WA4LPD PBBS

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NOTICE!!

Would the person who picked up the Antique Wireless Assn's magazine from the "sign up table" at last month's meeting please return it to Tim Buehlman, N4IQA. The cover show's 3 men standing by an old car... Tim collects the magazines, and brought the copy for us to look at -- not to keep!

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1988 Raleigh Area Amateur Exams
by
Wake Area Volunteer Examiners (WAVE)
Raleigh Amateur Radio Society (RARS)

MAR (none)	AUG 13 WAVE
APR 10 RARS HAMFEST	SEP 07 RARS MTG
MAY 21 WAVE	OCT 05 RARS MTG
JUN 01 RARS MTG	NOV ?? WAVE
JUL 06 RARS MTG	DEC 07 RARS MTG

For more info on the WAVE exams, contact:

John Johnson, WM4P
2118 Lyndhurst Dr.
Raleigh, NC 27610
--- 834-5001 ---

For more info on RARS exams, contact:

Vince Yakamavich, AA4MY
220 Carriage Tr.
Raleigh, NC 27614
--- 847-8512 ---

OSCAR 11 TRACKING DATA TABLES

One of the challenges of working satellites is knowing where and when to look for their signals. Several outstanding computer programs have been written to accomplish this task, and the data provided here was from "AMSAT QUICKTRAK," which was written by N4HY, and optimized for W4TZU's QTH. (Not to worry though, cuz at the speed the "bird" is moving, it would cover all of Wake Co. in a matter of seconds...)

A gain antenna (with azimuth & elevation rotators) would be necessary to hear the bird throughout the entire time it is "visable" to us, however, you can hear it on your HT & rubber duck around "MAX" time if the DXEL is 25 to 30 degrees or more.

The "DIGITALKER" is not particularly easy to understand, but it repeats everything over and over so you shuld be able to figure it out.

Sherman recommends listening on 145.825 when the bird is over head, although with the doppler shift, will vary from roughly .820 to .830

The following is an explanation of the table continued elsewhere in this EXCITER. Good luck!!

Date - GMT date

AOS - Acquisition of Signal: GMT time when OSCAR 11 comes over the horizon and the signal can be heard.

LOS - Loss of Signal: GMT time when satellite goes over the horizon.

MAX - GMT time when the satellite is at it maximum elevation above the horizon. (and is most easily heard)

DX/EL - Elevation in degrees above the horizon at "MAX" time.

AZ - Azimuth or bearing to the satellite in degrees at "MAX" time.

ARRL DXCC RULES

April 1987 Edition

Current Countries Total: 317

These rules are effective for 6 different types of DXCC Awards as outlined in Rule 1 below. Changes are announced under DXCC Notes in *QST*.

1) The DX Century Club Award, with certificate and DXCC lapel pin*, is available to ARRL members in Canada, the U.S. and possessions, and Puerto Rico, and all amateurs in the rest of the world. There are 6 separate DXCC awards available:

(a) **Mixed** (general type): contacts may be made using any mode since November 15, 1945. This DXCC is endorsable; see Rule 5.

(b) **Phone:** contacts must be made using radiotelephone since November 15, 1945. Confirmations for cross-mode contacts for this award must be dated before October 1, 1981. Confirmations need not indicate two way (2X) to be credited. This DXCC is endorsable; see Rule 5.

(c) **CW:** contacts must be made using CW since January 1, 1975. Confirmations for cross-mode contacts for this award must be dated before October 1, 1981. Confirmations need not indicate two way (2X) to be credited. This DXCC is endorsable; see Rule 5.

(d) **RTTY:** contacts must be made using radioteletype since November 15, 1945. Confirmations for cross-mode contacts for this award must be dated before October 1, 1981. Confirmations need not indicate two way (2X) to be credited. This DXCC is endorsable.

(e) **160-Meter:** contacts must be made on 160-meters since November 15, 1945. This DXCC is endorsable.

(f) **Satellite:** contacts must be made using satellites since March 1, 1965.

2) Confirmations must be submitted directly to ARRL Headquarters for all countries claimed. Confirmations for a total of 100 or more countries must be included with first application. By Board action 10-MHz confirmations are not creditable for DXCC.

3) The ARRL Countries List criteria will be used in determining what constitutes a "country."

4) Confirmations must be accompanied by a list of claimed countries and stations to aid in checking and for future reference.

5) Endorsement stickers for affixing to certificates will be awarded as additional credits are granted. These stickers are in exact multiples of 25, i.e. 125, 150, 175, between the 100 and 250 levels, and in multiples of 10 between 250 and 300, and in multiples of 5 above the 300 levels, with the exception of Satellite DXCC. Confirmations for additional countries may only be submitted for further credits in increments that will at least bring the new total up to the next endorsement level.

Exception. Once per year, any DXCC participant having an accredited DXCC total of 250, or more, may make a submission without regard to the number of cards submitted.

6) All contacts must be made with amateur stations working in the authorized amateur bands or with other stations licensed to work amateurs.

7) In cases of countries where amateurs are licensed in the normal manner, credit may be claimed only for stations using regular government-assigned call letters. No credit may be claimed for contacts with stations in any countries in which amateurs have been temporarily closed down by special government edict where amateur licenses were formerly issued in the normal manner.

8) All stations contacted must be "land stations." Contacts with ships, anchored or otherwise, and aircraft, cannot be counted.

9) All stations must be contacted from the same DXCC "country."

10) Contacts may be made over any period of years since November 15, 1945, for the Mixed, Phone, 160-Meter and RTTY DXCCs, January 1, 1975, for the CW DXCC, and from March 1, 1965, for the Satellite DXCC, provided only that all contacts be made under the provisions of Rule 9, and by the same station licensee; contacts may have been under different call letters in the same area (or country), if the licensee for all was the same.

(You may feed one DXCC from several calls held simultaneously.)

11) Any altered or forged confirmations submitted for DXCC credit may result in disqualification of the applicant. The eligibility of any DXCC applicant who was ever barred from DXCC to reapply, and the conditions for such application, shall be determined by the Awards Committee. Any holder of the DXCC Award submitting forged or altered confirmations must forfeit his right to continued DXCC participation.

12) Operating Ethics:

(a) Fair play and good sportsmanship in operating are required of all DX Century Club members. In the event of specific objections relative to continued poor operating ethics, an individual may be disqualified from the DXCC by action of the ARRL Awards Committee.

(b) Credit for contacts with individuals who have displayed continued poor operating ethics may be disallowed by action of the ARRL Awards Committee.

(c) For (a) and (b) above, "operating" includes confirmation procedures.

13) ARRL MEMBERSHIP IS REQUIRED of DXCC applicants in Canada, the U.S. and possessions, and Puerto Rico. All new DXCC applications must contain sufficient funds for safe return postage in the form of U.S. currency, check or money order. For DXCC endorsements, sufficient funds for safe return postage is also required. A chart showing suggested sums for return postage is available on request from ARRL Headquarters.

14) ARRL MEMBERSHIP IS NOT REQUIRED of foreign applicants. Each new DXCC application *must* contain sufficient funds for safe return postage. For DXCC endorsements, sufficient funds for safe return postage is also required. A chart showing suggested sums for return postage is available on request from ARRL Headquarters.

15) Decisions of the ARRL Awards Committee regarding interpretation of the rules here printed or later amended shall be final.

16) Address all applications to ARRL HQ, DXCC Desk, 225 Main St., Newington, CT 06111, U.S.A.

*A nominal fee of $2.00 is charged for the DXCC lapel pin.

5BDXCC

Note: The 5-Band DXCC certificate is available for working and confirming 100 DXCC countries on each of 5 bands (**with the exception of 10/18/24 MHz**). Contacts are valid from January 1, 1969. 5BDXCC qualifiers are also eligible for an individually engraved plaque (at an extra charge). Complete details, along with the required 5BDXCC application, can be obtained from the DXCC Desk.

Countries List Criteria

The ARRL Countries List is the result of some 40 years of progressive changes in DXing. The full list will not necessarily conform completely with these criteria since some of the listings were set up and recognized from pre-WWII. While the general policy has remained the same, specific mileages and additional points have, over the past 23 years, been added to the criteria. The specific mileages in Point 2(a) and Point 3, mentioned in the following, have been used in considerations made in April 1960, and after. The specific mileage in Point 2(b) has been used in considerations made in April, 1963, and after.

Any land area in the world, with the exception of such land that would come under Point 4 and 5, can be placed in one or more of the following categories. When the area in question meets at least [illegible] of the points in the criteria it may be considered eligible as a separate entity, i.e. a country, for our Countries List.

1) *Government:* An area by reason of Government constitutes a separate entity.

2) *Separation by water:* An island or a group of islands, not having its own government, is considered as a separate entity under the following conditions.

(a) Islands situated off shore from their governing area must be geographically separated by a minimum of 225 statute miles of open water. This point is concerned with islands off shore from the mainland *only*. This point *is not* concerned with islands which are part of an island group or are geographically located adjacent to an island group.

(b) Islands forming part of an island group or which are geographically located adjacent to an island, or island group, which have a common government, will be considered as separate entities provided there is at least 500 statute miles of open water separation between the two areas in question.

3) *Separation by foreign land:* In the case of a country, such as that covered by Point 1, which has a common goverment but which is geographically separated by land which is foreign to that country, if there is a complete separation of the country in question by a minimum of 75 miles of foreign land, the country is considered as two separate entities. This 75 statute miles of land is a requirement which is applicable to land areas *only*. In cases of areas made up of a chain of islands, there are no minimum requirements concerned with the separation by foreign land.

4) *Unadministered area:* Any area which is unadministered will not be eligible for consideration as a separate entity.

5) (a) Any area which is classified as a Demilitarized Zone, Neutral Zone or Buffer Zone will not be eligible for consideration as a separate entity.

(b) The following will not be eligible for consideration as a separate entity from the host country: Embassies, consulates and extra-territorial legal entities of all nature, including, but not limited to, monuments, offices of the United Nations agencies or related organizations, other inter-governmental organizations or diplomatic missions.

DXCC Accreditation Criteria

During the course of more than 40 years of DXCC administration, standards have evolved in the acceptance of confirmations for DXCC credit. These criteria codify longstanding practice. The intent is to assure that DXCC credit is given only for contacts with operations that are conducted appropriately in two respects: (1) properly licensed; (2) physically present in the country to be credited. The following points should be of particular interest to DXpeditions: (1) The vast majority of operations are accredited routinely without any requirement for submission of documents. (2) In some instances, especially DXpeditions and in countries that previously have evidenced some reluctance to license amateur stations, or allow access, authenticating documents may be requested for review prior to accreditation. Such supporting documents could include the following: (a) Photocopy of license or operating authorization. (b) For amateurs foreign to the country, photocopy of passport entry and exit stamps. (c) For offshore islands, a landing permit and/or signed statement of the transporting ship's captain showing all pertinent data (dates, etc.). (d) For some locations where special permission is known to be required to gain access legally, evidence of this permission having been given may be required. The purpose of these accreditation requirements is to: (1) preserve the program's continued integrity; and (2) ensure that the DXCC program does not encourage amateurs "to bend the rules" in their enthusiasm, thus jeopardizing the future development of Amateur Radio. Every effort will be made to apply these criteria in a uniform manner in conformity with these objectives.

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ARRL DXCC COUNTRIES LIST

NOTE: * INDICATES CURRENT LIST OF COUNTRIES FOR WHICH QSLs MAY BE FORWARDED BY THE ARRL MEMBERSHIP OUTGOING QSL SERVICE.

NOTE: † INDICATES COUNTRIES WITH WHICH U.S. AMATEURS MAY LEGALLY HANDLE THIRD-PARTY MESSAGE TRAFFIC.

HOW TO USE THE ARRL OUTGOING QSL SERVICE

1) Presort your DX QSLs alphabetically by call-sign prefix (AP, C6, CE, DL, F, G, JA, LU, PY, 5N, 9Y and so on).
2) Enclose the address label from your current copy of *QST*. The label shows that you are a current ARRL member.
3) Enclose payment of $1 per each pound (or less) of cards — approximately 155 cards weigh one pound. In other words, $1 is the *minimum charge* whether you send 1 card or 155 cards. Please pay by check (or money order) and write your call sign on the check. Do not send cash.
4) Include only the cards, address label and check in the package. Wrap the package securely and address it to the ARRL Outgoing QSL Service, 225 Main St., Newington, CT 06111.
5) Further details are available from the Outgoing QSL Bureau at ARRL HQ.

Prefix	Country	Continent	ZONE		MIXED	PHONE	CW	RTTY	SAT		160	80	40	20	15	12	10	
			ITU	CQ														
A2*	Botswana	AF	57	38														
A3*	Tonga	OC	62	32														
A4*	Oman	AS	39	21														
A5	Bhutan	AS	41	22														
A6	United Arab Emirates	AS	39	21														
A7	Qatar	AS	39	21														
A9*	Bahrain	AS	39	21														
AP-AS*	Pakistan	AS	41	21														
BV	Taiwan	AS	44	24														
BY, BT*	China	AS	(A)	23,24														
C2*	Nauru	OC	65	31														
C3*	Andorra	EU	27	14														
C5†*	The Gambia	AF	46	35														
C6*	Bahamas	NA	11	08														
C8-9	Mozambique	AF	53	37														
CA-CE†*	Chile	SA	14, 16	12														
CE9/KC4[4]*	Antarctica	AN	(B)	(C)														
CEØ†*	Easter I.	SA	63	12														
CEØ†*	San Felix	SA	14	12														
CEØ†*	Juan Fernandez	SA	14	12														
CM, CO†*	Cuba	NA	11	08														
CN*	Morocco	AF	37	33														
CP†*	Bolivia	SA	12, 14	10														
CT*	Portugal	EU	37	14														
CU, CT2*	Azores	EU	36	14														
CT3*	Madeira Is.	AF	36	33														
CV-CX†*	Uruguay	SA	14	13														
CYØ	Sable I.	NA	09	05														
CYØ	St. Paul I.	NA	09	05														
D2-3*	Angola	AF	52	36														
D4*	Cape Verde	AF	46	35														
D6[28]	Comoros	AF	53	39														
DA-DL[3]*	Fed. Rep. of Germany	EU	28	14														
DU-DZ*	Philippines	OC	50	27														
EA-EH*	Spain	EU	37	14														
EA6-EH6*	Balearic Is.	EU	37	14														
EA8-EH8*	Canary Is.	AF	36	33														
EA9-EH9*	Ceuta and Melilla	AF	37	33														
EI-EJ*	Ireland	EU	27	14														
EL†*	Liberia	AF	46	35														

Prefix	Country	Continent	ZONE		MIXED	PHONE	CW	RTTY	SAT		160	80	40	20	15	12	10	
			ITU	CQ														
EP-EQ*	Iran	AS	40	21														
ET	Ethiopia	AF	48	37														
F*	France	EU	27	14														
FT8W*	Crozet	AF	68	39														
FT8X*	Kerguelen Is.	AF	68	39														
FT8Z*	Amsterdam & St. Paul Is.	AF	68	39														
FG*	Guadeloupe	NA	11	08														
FG, FS[1]*	Saint Martin	NA	11	08														
FH[26]*	Mayotte	AF	53	39														
FK*	New Caledonia	OC	56	32														
FM*	Martinique	NA	11	08														
FO*	Clipperton I.	NA	10	07														
FO*	Fr. Polynesia	OC	63	32														
FP*	St. Pierre & Miquelon	NA	09	05														
FR/G[4]*	Glorioso Is.	AF	53	39														
FR/J,E[4]*	Juan de Nova, Europa	AF	53	39														
FR*	Reunion	AF	53	39														
FR/T*	Tromelin	AF	53	39														
FW*	Wallis & Futuna Is.	OC	62	32														
FY*	Fr. Guiana	SA	12	09														
G*#	England	EU	27	14														
GD*	Isle of Man	EU	27	14														
GI*	Northern Ireland	EU	27	14														
GJ*	Jersey	EU	27	14														
GM*	Scotland	EU	27	14														
GU*	Guernsey & Dep.	EU	27	14														
GW*	Wales	EU	27	14														
H4*	Solomon Islands	OC	51	28														
HA, HG*	Hungary	EU	28	15														
HB*	Switzerland	EU	28	14														
HBØ*	Liechtenstein	EU	28	14														
HC-HD†*	Ecuador	SA	12	10														
HC8-HD8†*	Galapagos Is.	SA	12	10														
HH†*	Haiti	NA	11	08														
HI†*	Dominican Republic	NA	11	08														
HJ-HK†*	Colombia	SA	12	09														
HKØ†*	Malpelo I.	NA	12	09														
HKØ†*	San Andreas & Providencia	NA	11	07														
HL*	Korea	AS	44	25														
HO-HP†*	Panama	NA	11	07														
HQ-HR†*	Honduras	NA	11	07														
HS*	Thailand	AS	49	26														
HV*	Vatican	EU	28	15														
HZ	Saudi Arabia	AS	39	21														
I*	Italy	EU	28	15														
ISØ, IMØ*	Sardinia	EU	28	15														
J2*	Djibouti	AF	48	37														
J3†*	Grenada	NA	11	08														
J5	Guinea-Bissau	AF	46	35														
J6†*	St. Lucia	NA	11	08														
J7†*	Dominica	NA	11	08														
J8†*	St. Vincent & Dep.	NA	11	08														

#Third-party traffic permitted with special-events stations in the United Kingdom having the prefix GB *only*, with the exception that GB3 stations are not included in this agreement.

Prefix	Country	CONTINENT	ZONE		MIXED	PHONE	CW	RTTY	SAT		160	80	40	20	15	12	10	
			ITU	CQ														
JA-JS*	Japan	AS	45	25														
JD1[15]*	Minami Torishima	OC	45	27														
JD1[6]*	Ogasawara	AS	45	27														
JT-JV*	Mongolia	AS	32, 33	23														
JW*	Svalbard	EU	18	40														
JX*	Jan Mayen	EU	18	40														
JY†*	Jordan	AS	39	20														
K, W, N, AA-AK	United States of America	NA	6, 7, 8	3, 4, 5														
KC6[32](E. Caroline Is.)	Micronesia	OC	65	27														
KC6[32](W. Caroline Is.)	Belau	OC	64	27														
KG4†*	Guantanamo Bay	NA	11	08														
KH1†	Baker, Howland Is.	OC	61, 62	31														
KH2†*	Guam	OC	64	27														
KH3†	Johnston I.	OC	61	31														
KH4†*	Midway Is.	OC	61	31														
KH5†	Palmyra, Jarvis Is.	OC	61	31														
KH5K†	Kingman Reef	OC	61	31														
KH6†*	Hawaiian Is.	OC	61	31														
KH7†	Kure I.	OC	61	31														
KH8†*	American Samoa	OC	62	32														
KH9†	Wake I.	OC	65	31														
KH0†*	Mariana Is.	OC	64	27														
KL7†*	Alaska	NA	1, 2	1														
KP1†	Navassa I.	NA	11	08														
KP2†*	Virgin Is.	NA	11	08														
KP4†*	Puerto Rico	NA	11	08														
KP5[27]†	Desecheo Is.	NA	11	08														
KX6*	Marshall Is.	OC	65	31														
LA-LN*	Norway	EU	18	14														
LO-LW†*	Argentina	SA	14, 16	13														
LX*	Luxembourg	EU	27	14														
LZ*	Bulgaria	EU	28	20														
OA-OC†*	Peru	SA	12	10														
OD*	Lebanon	AS	39	20														
OE*	Austria	EU	28	15														
OF-OI*	Finland	EU	18	15														
OH0*	Aland Is.	EU	18	15														
OJ0*	Market Reef	EU	18	15														
OK-OM*	Czechoslovakia	EU	28	15														
ON-OT*	Belgium	EU	27	14														
OX*	Greenland	NA	5, 75	40														
OY*	Faroe Is.	EU	18	14														
OZ*	Denmark	EU	18	14														
P2[7]*	Papua New Guinea	OC	51	28														
PA-PI*	Netherlands	EU	27	14														
PJ2-4, P4*	Neth. Antilles	SA	11	09														
PJ5-8*	St.Maarten,Saba,St.Eustatius	NA	11	08														
PP-PY†*	Brazil	SA	(D)	11														
PP0-PY0†*	Fernando de Noronha	SA	13	11														
PP0-PY0†*	St. Peter & St. Paul Rocks	SA	13	11														
PP0-PY0†*	Trindade & Martin Vaz. Is.	SA	15	11														
PZ*	Suriname	SA	12	09														

Prefix	Country	Continent	ZONE		MIXED	PHONE	CW	RTTY	SAT.		160	80	40	20	15	12	10	
			ITU	CQ														
S2*	Bangladesh	AS	41	22														
S7*	Seychelles	AF	53	39														
S9	Sao Tome & Principe	AF	47	36														
SA-SM*	Sweden	EU	18	14														
SN-SR*	Poland	EU	28	15														
ST*	Sudan	AF	48	34														
ST0*	Southern Sudan	AF	48	34														
SU*	Egypt	AF	38	34														
SV-SZ*	Greece	EU	28	20														
SV5*	Dodecanese	EU	28	20														
SV9*	Crete	EU	28	20														
SV/A*	Mount Athos	EU	28	20														
T2[16]	Tuvalu	OC	65	31														
T30	W. Kiribati (Gilbert & Ocn Is.)	OC	65	31														
T31	C. Kiribati (Brit. Phoenix Is.)	OC	62	31														
T32	East Kiribati (Line Is.)	OC	61,63	31														
T5	Somalia	AF	48	37														
T7*	San Marino	EU	28	15														
TA-TC*	Turkey	EU/AS	39	20														
TF*	Iceland	EU	17	40														
TG, TD†*	Guatemala	NA	11	07														
TI, TE†*	Costa Rica	NA	11	07														
TI9†*	Cocos I.	NA	11	07														
TJ	Cameroon	AF	47	36														
TK*	Corsica	EU	28	15														
TL[8]	Central African Rep.	AF	47	36														
TN[9]	Congo	AF	52	36														
TR[10]	Gabon	AF	52	36														
TT[11]	Chad	AF	47	36														
TU[12]	Ivory Coast	AF	46	35														
TY[13]	Benin	AF	46	35														
TZ[14]	Mali	AF	46	35														
UA1,3,4,6*	European Russian R.S.F.S.R.	EU	(E)	16														
UA1*	Franz Josef Land	EU	75	40														
UA2*	Kaliningrad	EU	29	15														
UA8,9,0*	Asiatic R.S.F.S.R.	AS	(F)	(G)														
UB, UT, UY*	Ukraine	EU	29	16														
UC*	Byelorussia	EU	29	16														
UD*	Azerbaijan	AS	29	21														
UF*	Georgia	AS	29	21														
UG*	Armenia	AS	29	21														
UH*	Turkmenistan	AS	30	17														
UI*	Uzbekistan	AS	30	17														
UJ*	Tadzhikistan	AS	30	17														
UL*	Kazakhstan	AS	29-31	17														
UM*	Kirghizia	AS	30,31	17														
UO*	Moldavia	EU	29	16														
UP*	Lithuania	EU	29	15														
UQ*	Latvia	EU	29	15														
UR*	Estonia	EU	29	15														

Prefix	Country	Cont. area	ZONE		MIXED	PHONE	CW	RTTY	SAT.		160	80	40	20	15	12	10	
			ITU	CQ														
V2†•	Antigua & Barbuda	NA	11	08														
V3†•	Belize	NA	11	07														
V4[15]†	St. Christopher & Nevis	NA	11	08														
V8•	Brunei	OC	54	28														
VE, VO, VY†•	Canada	NA	(H)	1-5														
VK†•	Australia	OC	(I)	29, 30														
VK†•	Lord Howe I.	OC	60	30														
VK9†•	Willis I.	OC	60	30														
VK9†•	Christmas I.	OC	54	29														
VK9†•	Cocos-Keeling Is.	OC	54	29														
VK9†•	Mellish Reef	OC	56	30														
VK9†•	Norfolk I.	OC	60	32														
VKØ†•	Heard I.	AF	68	39														
VKØ†•	Macquarie I.	OC	60	30														
VP2E[15]	Anguilla	NA	11	08														
VP2M[18]•	Montserrat	NA	11	08														
VP2V[15]•	Br. Virgin Is.	NA	11	08														
VP5•	Turks & Caicos Is.	NA	11	08														
VP8•	Falkland Is.	SA	16	13														
VP8, LU•	South Georgia I.	SA	73	13														
VP8, LU•	South Orkney Is.	SA	73	13														
VP8, LU•	South Sandwich Is.	SA	73	13														
VP8,CE9,HF8,LU,4K1•	South Shetland Is.	SA	73	13														
VP9•	Bermuda	NA	11	05														
VQ9•	Chagos	AF	41	39														
VR6†	Pitcairn I.	OC	63	32														
VS6•	Hong Kong	AS	44	24														
VU•	India	AS	41	22														
VU•	Andaman & Nicobar Is.	AS	49	26														
VU•	Laccadive Is.	AS	41	22														
XA-XI†•	Mexico	NA	10	06														
XA4-XI4†•	Revilla Gigedo	NA	10	06														
XT[17]	Burkina Faso	AF	46	35														
XU	Kampuchea	AS	49	26														
XW	Laos	AS	49	26														
XX9	Macao	AS	44	24														
XY-XZ	Burma	AS	49	26														
Y2-9•[2]	German Dem. Rep.	EU	28	14														
YA	Afghanistan	AS	40	21														
YB-YH[21]•	Indonesia	OC	51,54	28														
YI•	Iraq	AS	39	21														
YJ•	Vanuatu	OC	56	32														
YK•	Syria	AS	39	20														
YN†•	Nicaragua	NA	11	07														
YO-YR•	Romania	EU	28	20														
YS†•	El Salvador	NA	11	07														
YT-YU, YZ•	Yugoslavia	EU	28	15														
YV-YY†•	Venezuela	SA	12	09														
YVØ†•	Aves I.	NA	11	08														
Z2•	Zimbabwe	AF	53	38														
ZA	Albania	EU	28	15														

Prefix	Country	[illegible]	ZONE ITU	ZONE CQ	MIXED	PHONE	CW	RTTY	SAT		160	80	40	20	15	12	10	
ZB2*	Gibraltar	EU	37	14														
ZC4*	UK Sov. Base Areas on Cyprus	AS	39	20														
ZD7	St. Helena	AF	66	36														
ZD8*	Ascension I.	AF	66	36														
ZD9	Tristan da Cunha & Gough I.	AF	66	38														
ZF*	Cayman Is.	NA	11	08														
ZK1*	So. Cook Is.	OC	62	32														
ZK1*	No. Cook Is.	OC	62	32														
ZK2	Niue	OC	62	32														
ZK3	Tokelau Is.	OC	62	31														
ZL,ZM*	New Zealand	OC	60	32														
ZL7*	Chatham Is.	OC	60	32														
ZL8*	Kermadec Is.	OC	60	32														
ZL9*	Auckland I. & Campbell I.	OC	60	32														
ZP*	Paraguay	SA	14	11														
ZR-ZU*	South Africa	AF	57	38														
ZS8-ZU2*	Prince Edward & Marion Is.	AF	57	38														
ZR3-ZU3*	(Namibia) S.W. Africa	AF	57	38														
1A0*	Sov. Mil. Order of Malta	EU	28	15														
1S[1]	Spratly Is.	AS	50	26														
3A*	Monaco	EU	27	14														
3B6, 7*	Agalega & St. Brandon	AF	53	39														
3B8*	Mauritius	AF	53	39														
3B9*	Rodriguez I.	AF	53	39														
3C	Equatorial Guinea	AF	47	36														
3C0	Pagalu I.	AF	52	36														
3D2*	Fiji	OC	56	32														
3D6[1]*	Swaziland	AF	57	38														
3V	Tunisia	AF	37	33														
3W, XV	Vietnam	AS	49	26														
3X	Guinea	AF	46	35														
3Y*	Bouvet	AF	67	38														
3Y*	Peter I	AN	72	12														
4P-4S*	Sri Lanka	AS	41	22														
4U1*	ITU Geneva	EU	28	14														
4U	HQ, United Nations	NA	08	05														
4W	Yemen	AS	39	21														
4X, 4Z[1]*	Israel	AS	39	20														
5A	Libya	AF	38	34														
5B*	Cyprus	AS	39	20														
5H-5I	Tanzania	AF	53	37														
5N-5O*	Nigeria	AF	46	35														
5R-5S	Madagascar	AF	53	39														
5T[10]*	Mauritania	AF	46	35														
5U[10]	Niger	AF	46	35														
5V*	Togo	AF	46	35														
5W*	Western Samoa	OC	62	32														
5X	Uganda	AF	48	37														
5Y-5Z*	Kenya	AF	48	37														

Prefix	Country	ZONE		MIXED	PHONE		RTTY	SAT		160	80	40	20	15	12	10	
			ITU	CQ													
6V-6W[20]*	Senegal	AF	46	35													
6Y†*	Jamaica	NA	11	08													
7O	People s Dem Rep of Yemen	AS	39	21													
7P*	Lesotho	AF	57	38													
7Q	Malawi	AF	53	37													
7T-7Y*	Algeria	AF	37	33													
8P*	Barbados	NA	11	08													
8Q	Maldive Is.	AS/AF	41	22													
8R†*	Guyana	SA	12	09													
9G[22]†	Ghana	AF	46	35													
9H*	Malta	EU	28	15													
9I-9J*	Zambia	AF	53	36													
9K*	Kuwait	AS	39	21													
9L†*	Sierra Leone	AF	46	35													
9M2, 4[23]*	West Malaysia	AS	54	28													
9M6, 8[23]*	East Malaysia	OC	54	28													
9N	Nepal	AS	42	22													
9Q-9T*	Zaire	AF	52	36													
9U[24]	Burundi	AF	52	36													
9V[25]*	Singapore	AS	54	28													
9X[24]*	Rwanda	AF	52	36													
9Y-9Z†*	Trinidad & Tobago	SA	11	09													
J2/A*	Abu Ail, Jabal at Tair	AS	39	21													

Notes

[1]Unofficial Prefix.

[2](DA-DL) Only contacts made September 17, 1973, and after, will count for this country.

[3](DM, DT, Y2-9) Only contacts made September 17, 1973, and after, will count for this country.

[4](FR) Only contacts made June 25, 1960, and after, will count for this country.

[5](JD, KA1) Formerly Marcus Island.

[6](JD, KA1) Formerly Bonin and Volcano Islands.

[7](P2) Only contacts made September 16, 1975, and after, will count for this country.

[8](TL) Only contacts made August 13, 1960, and after, will count for this county.

[9](TN) Only contacts made August 16, 1960, and after, will count for this country.

[10](TR) Only contacts made August 17, 1960, and after, will count for this country.

[11](TT) Only contacts made August 7, 1960, and after, will count for this country.

[12](TU) Only contacts made August 7, 1960, and after, will count for this country.

[13](TY) Only contacts made August 1, 1960, and after, will count for this country.

[14](TZ) Only contacts made June 20, 1960, and after, will count for this country.

[15](VP2) For credits on QSOs made before June 1, 1958, see page 97, June 1958 *QST*.

[16](T2, VR8) Only contacts made January 1, 1976, and after, will count for this country.

[17](XT) Only contacts made August 6, 1960, and after, w ·ll for this country.

[18](5T) Only contacts made June 20, 1960, and after, will count for this country.

[19](5U) Only contacts made August 3, 1960, and after, will count for this country.

[20](6W) Only contacts made June 20, 1960, and after, will count for this country.

[21](8F, YB) Only contacts made May 1, 1963, and after, will count for this country.

[22](9G) Only contacts made March 5, 1957, and after, will count for this country.

[23](9M2, 4, 6, 8) Only contacts made September 16, 1963, and after, will count for this country.

[24](9U, 9X) Only contacts made July 1, 1962, and after, will count for this country.

[25](9V) Contacts made between September 15, 1963 and August 9, 1965, count for East Malaysia.

[26](D6, FH8) Only contacts made July 5, 1975, and after, will count for this country.

[27](KP5, KP4) Only contacts made March 1, 1979, and after, will count for this country.

[28](KC6) Includes Yap Islands beginning January 1, 1981.

[29](KC6) Doesn't include Yap Is. beginning January 1, 1981.

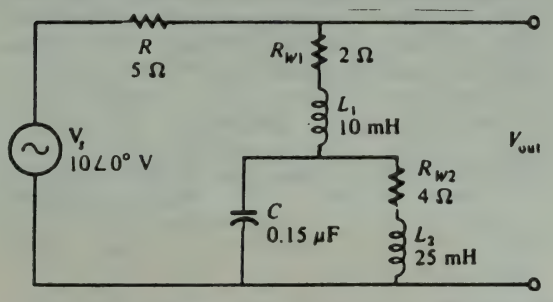
[A]Also AT0, DP0, FT8Y, LU, OR4, VK0, VP8, Y8, ZL5, ZS1, ZX0, 3Y, 4K1, 8J1, etc. QSL via country under whose auspices the particular station is operating. The availability of a third-party traffic agreement and a QSL Bureau applies to the country under whose auspices the particular station is operating.

OSCAR 11 TRACKING DATA TABLES

DATE	AOS	LOS	MAX	DX/EL	AZ
04MAR	1537	1550	1554	59	292
04MAR	1716	1724	1720	5	302
05MAR	0103	0113	0108	9	61
05MAR	0238	0251	0244	80	263
05MAR	0418	0426	0422	5	272
05MAR	1437	1450	1444	30	94
05MAR	1615	1627	1621	24	291
06MAR	0138	0151	0145	23	70
06MAR	0315	0329	0322	30	264
06MAR	1339	1348	1344	5	89
06MAR	1515	1529	1522	79	94
06MAR	1653	1703	1658	10	297
11MAR	0132	0144	0138	20	68
11MAR	0309	0322	0315	35	265
11MAR	1333	1340	1337	4	87
11MAR	1508	1522	1515	67	98
11MAR	1646	1657	1652	12	297
12MAR	0036	0042	0039	3	57
12MAR	0209	0222	0216	49	68
12MAR	0347	0359	0353	14	269
12MAR	1409	1421	1415	15	92
12MAR	1546	1559	1552	47	288
12MAR	1726	1732	1729	3	303
13MAR	0111	0122	0116	12	64
13MAR	0246	0300	0253	64	260
13MAR	0428	0435	0431	3	274
13MAR	1446	1500	1453	38	98
13MAR	1624	1636	1630	20	293
18MAR	0104	0115	0110	10	63
18MAR	0239	0253	0246	75	275
18MAR	0421	0428	0424	5	273
18MAR	1439	1453	1446	32	96
18MAR	1617	1630	1623	23	291
19MAR	0141	0153	0147	25	69
19MAR	0318	0331	0324	29	265
19MAR	1341	1350	1346	6	89
19MAR	1517	1531	1524	84	80
19MAR	1655	1705	1700	9	296
20MAR	0044	0052	0048	5	57
20MAR	0217	0231	0224	62	73
20MAR	0357	0407	0402	11	269
20MAR	1417	1430	1424	19	92
20MAR	1554	1608	1601	30	290
20MAR	1535	1739	1737	1	304
24MAR	0134	0146	0140	21	68
24MAR	0311	0324	0317	34	265
24MAR	1335	1343	1339	4	88
24MAR	1510	1524	1517	71	95
24MAR	1648	1659	1654	11	299
25MAR	0038	0045	0041	3	57
25MAR	0211	0224	02118	52	71
25MAR	0349	0401	0355	13	269
25MAR	1411	1423	1417	16	93
25MAR	1548	1601	1554	44	288

TTNTT*
by
wa9new

Now here's an interesting circuit:



At one frequency the 0.15 uF/25 mH combination is parallel resonant and the output is virtually equal to the input. At another frequency the network is series resonant and the output goes to a minimum.

Your task, should you be willing to accept it, is to determine what these two frequencies are and calculate the output at series resonance.

The solution appears elsewhere in this issue (or next month's if there isn't enough room this month!).

* Technical Topics for Non Technical Types.

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ANOTHER ASSAULT ON 220 MHZ??!!

ARRL NR 18 2/16/88

MORE ON 220 MHZ. ON JANUARY 29 THE UNITED PARCEL SERVICE FILED A MOTION FOR ACCEPTANCE OF LATE FILED COMMENTS AND THE COMMENTS THEMSELVES IN GENERAL DOCKET 87 14. THIS FCC DOCKET PROPOSES TO REALLOCATE 220 TO 222 MHZ EXCLUSIVELY TO LAND MOBILE FOR A NEW NARROWBAND SERVICE.

UNITED PARCEL PROPOSES TO BUILD A NATIONWIDE DATA NETWORK FOR ITS DELIVERY TRUCKS USING AMPLITUDE COMPANDORED SINGLE SIDEBAND EQUIPMENT.

THE UPS PETITION COMES SIX MONTHS AFTER THE FINAL DEADLINE FOR FILING COMMENTS IN THE DOCKET. ITS ACCEPTANCE FOR FILING WILL BE STRONGLY OPPOSED BY THE ARRL, NEEDLESS TO SAY. ARRL EFFORTS TO PRESERVE THE ENTIRE 220 TO 225 MHZ BAND FOR AMATEUR USE CONTINUE UNABATED ON SEVERAL FRONTS AR

PACKET RACKET: February, 1988
Journal of:
The Wake Digital Communications Group

Officer elections were held and the following officers were elected for 1988: Pres.: Cecil Tucker, WA4LPD; Vice-Pres.: Jim Curran, KA4OJN; Treas.: Herb Lacey, N4UE; Secretary: Tim Kemp, WB4BAH.

TCP/IP

What is it? What does it do? What does it take to run it? What are the advantages and disadvantages of it? In this article, I will try to answers those questions briefly.

TCP/IP stands for Transmission Control Protocol and Internet Protocol. This means that it is simply another protocol like NET/ROM and AX.25. It was primarily developed for the military, but is now used by the military, commercial, and research groups. It is also starting to be used in Amateur Radio work. Around the country, there are quite a few groups that now have a network of TCP/IP running.

It is a protocol that allows you to send and receive mail from other stations, send and receive files (both text and program) from other stations and carry on keyboard to keyboard sessions with other stations. It will also allow you to do all these things at one time. Of course, if you are doing these all at once, your thruput will be a whole lot slower than if you were just doing one. However, they all will get thru.

With the timers that TCP/IP uses, you will not "retry out." Things will simply slow down as the channel gets more crowded. It is more like an actual network than the AX.25 set-ups that are being used today. Once you learn to use it, you can sit back and let it do the work; you don't have to do it all! As an example, you can download a long file from another station without worrying that you are tying up the frequency. It will stop and wait for others to use the frequency, and when they are done, you will go back to downloading. Since it supports multiple sessions, you don't have to worry about tying up his computer because others can be using it also (as well as if you are running multi-tasking he can be getting work out of his computer also).

The newest TNC's have KISS (Keep It Simple Stupid) ROM's already installed in them. If you do not have one of these, there are programs available that will allow you to burn a ROM and put in the KISS code. These are also available for the TNC-1, so now, your old TNC can run the latest. You do need the KISS code in your TNC to be able to run TCP/IP. At this time, you also need to have an IBM (or clone) computer to run the programs. You do not have to dedicate a computer to running this. It is just like now, when you want to get on the air, you load the program and you are ready to go.

Some of the advantages are: you can send and receive text and program files; you can send and receive mail even when you are not there, if you wish to run in unattended mode; the scheme for not transmitting when the channel is busy is better than under the present AX.25; you can run in unconnected mode or if you prefer you can connect under the AX.25 protocol, and all the programs to run it as well as the source code is free.

Some of the disadvantages are: you have to have an IBM (or clone) to run it; there is no split screen in keyboard mode, so that if you are talking to someone and they send you a frame while you are typing, it will get added into what you see, but not what the other person sees; it takes a KISS ROM in your TNC, and it will take you a while to learn how to operate it.

Since your computer is now performing all the functions that your TNC used to perform, you will have to learn some new commands. It does not take a long time to learn them and there is more documentation coming out all the time to help in getting you up and running with the least effort on your part. One other draw back is that you can not monitor the channel. It is more like when you are on a large system with a lot of users. You know that they are there, but you can not see what they are doing.

I hope that this helps to explain TCP/IP a little and helps you to understand some of those "weird packets" you have seen on 147.54 MHz lately.

KA4OJN

GET IT UP AND KEEP IT THAT WAY

Have you ever considered getting an antenna up in the air? Wire is nice, but at best, it is a compromise between transmitting with a dummy load and a simple triband beam strapped to your chimney.

As a Novice operator, you settled on a low-power CW transmitter, a surplus receiver, and a simple wire antenna. Later, you went to one of the real high-tech transceivers, an antenna tuner and possibly a linear amplifier. Something is inconsistent, you are still using a low-altitude radiator with a high-tech station. When you are ready to complete the upgrade of your station, be prepared to spend some time on planning and some money on a good antenna support structure. The very best antenna will do no good as a crumpled mass of metal on the ground after a wind or ice storm.

So, after having put a "few" relatively expensive radiating devices up in the air, I have learned a some do's and don'ts on getting it up and keeping it there.

The most critical thing you can short yourself on is planning. Site your lot for the acceptable locations for a tower. Once you have decided on the best location, double check yourself. Have someone come over and discuss your intended location. A fresh pair of eyes can often spot potential trouble spots before you commit yourself to a less than optimal location.

Can the tower be located against your house? Can you get a clear shot at all three guy wire anchor points. How about pine trees falling? Do you have any questionable pines too close to your tower site? Underground gas pipes can cause a real problem if you place your tower too close to them. Find out where they are located. Same with underground power cable (to yard lights, work shed etc.).

Once you have convinced yourself that the water, power, and gas supply to your home will not be sacrificed for your new antenna support, you're ready to accumulate materials.

Selection of a tower has so many variables that it would be an article all by itself. Suffice it to say that every tower I have worked on in the Raleigh/Wake county area has been a Rohn 25G (12 inches on a side, 10-foot long sections). This is the most sturdy type of tower in the average amateur's price range, but it has its drawbacks. It is fairly permanent and it has to be climbed. It will, however hold up most anything that a DXer or contester would care to stack on it, if installed properly.

In the next part of this article, I will discuss all aspects of materials and installation. Where can you save money without sacrificing safety? What about lightning protection, child safety, and other safety considerations? Where and how can you fasten guy wires? Even a few hints on neighbor involvement in your project (it helps if they become involved up front). Finally, who can help you with the actual erection? No matter how macho you are, you can't do it by yourself.

Good DXing!

Jim (N4BYO)

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WANTED!!!

Have URGENT need of a 12AB5 tube. Call Dave, KB4OKB, day 740-0625 or nite 553-5224 (Clayton).

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FOR SALE!!

Heathkit HW-100, 10 thru 80 meter HF station with speaker & power supply. Good first station. Call John, KC4CZL. Home 471-6894, work 682-9371 (both numbers in Durham).

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Don't forget the Annual Awards Banquet, being held in lieu of our regular monthly meeting. Wednesday, March 2nd, at Balentines' in Cameron Villiage. Social hour 6:30 PM, dinner at 7:30. Tickets $7 from our VP Chuk, KB4MDZ, @ 266-5273. TIME'S RUNNING OUT!! CALL CHUK TODAY!!

NICADS: BLESSING OR BANE?

Seems like every time something new comes along, it costs more and it has a whole new set of problems. Nicads are no exception. They're nice if you want 'walk-around' portability, and I guess we all do, but they are costly and they don't seem to last long. Is there anything you can do to make 'em last longer? Yes, there may well be. It depends on the pack.

All nicad packs are made up of some number of individual cells connected in series. Each cell has a rating of 1.2 volts. It doesn't matter how long or short, how skinny or fat (and they come in all sizes), they all have the same voltage rating. The only thing that changes from one pack to another is the number of cells. A '12 V' pack has ten cells connected in series. A '9.6 V' pack has eight. Each cell can store some amount of energy. How much energy is determined by the amount of chemically active material contained. If each cell contained precisely the same number of molecules of material, then each could store the same amount of energy. The same amount of energy would be stored in each cell when you charged the pack, and each cell would deliver the same amount of energy to the load during use. But no two cells have the same number of molecules of chemically active material. Each cell will have a different internal resistance. Each cell will convert a different amount of electrical energy to heat energy during each discharge and charge cycle. When the pack is always charged and discharged with the cells connected in series, the one with the least amount of active material will have repeatedly converted the greater amount of electrical energy into heat energy. If you 'completely discharge' the pack with the cells connected in series, you can be sure that at least one of them will develop an internal short. Even if you don't 'completely discharge' the pack, you'll find that it 'develops a memory' after use over a period of time. 'Memory' means that the weakest cell has discharged past its knee, the point at which the cell voltage drops off rapidly. The 'BAT' light comes on. If you quickly put it back in the charger you can avoid the internal short. But the weakest cell will not store as much energy during the charge cycle as the others. And during the next discharge cycle it'll reach its 'knee' quicker. Can you do anything to solve this problem? Yes, IF you can get access to each cell!

If the pack is 'dead' and you have to spring for a new one any way, what have you got to lose? Disassemble it. Be careful. Don't cut too deep. Some packs are just a series connection of cells wrapped in heat shrink and some are encapsulated in hard plastic. But if you cut carefully along the seams, you may be able to open these. If you can get voltmeter probes to the ends of each cell, some should show about 1.2V and one or more may show 0V. If you have any with a 0V reading, it's a good bet they're internally shorted and need help. Put about 50 to 100mA of current through them and watch the voltage across each one. If they are internally shorted you may read a few tenths of a volt across each one as a result of the internal resistance but the voltage will remain constant. If the cell is not shorted, it will come up to 1V or better within a second or two. If not, get mean and cruel.

Charge a 25,000 to 50,000uFd cap to something like 30 or 40 volts. Now, plus to plus and minus to minus, discharge that fully charged capacitor through that poor little nicad. Yes, that does make a lot of noise and you can just about arc weld your leads to the nicad. Believe me, you won't have to do it more than two or three times and that nicad will shape up! Between ZAPS put a little current through it and see if it's charging. The voltage should come up quickly.

Next, put a small valued resistor, something like 10 to 15 ohms, across each 'good' nicad in the pack. It'll take a few hours to discharge all of them, depending on how many resistors you have. When they get down to just a few millivolts each, put them back in series and charge them up.

I'm still using the same eight that came with my Santec in '83 and you've never heard me on any other two meter rig. And I'd prefer not to talk about the Heath handheld I used for several years before that. Good luck!

by Bruce Eggers, WA9NEW

BERT'S BEAT

WITH

BERT BAILEY, W4FMN

RARS ON THE ROAD AGAIN!

Yep, it's roundup time again and ole Bill of the WB4CCA ranch will be corralling all volunteers.. So hurry up and get in line. This run will be a mere 5K on Sunday, 14 Feb. in the Millbrook Post Office area and George's Exide Electronics. Being only a 5K, ham operators are used just a short time. So you can get back in time to see the Tarheels beat somebody. Don't know who it will be but UNC always plays a cliffhanger during this perennial Run for the Roses. For the athletic ham, this is a great chance to see some truely outstanding runners. Check the times and see if you can run one kilometer in the time the winners 3.1 of 'em. If you can, pop ur chest up; you're ahead of many, many fellow Americans. If WB4CCA ever decides to trade in his mike for some Adidas shoes, my time for the 5K may look not too bad. Hi Hi!!
So, fellow RARSites, prepare yourselves for the running season. Run your feet on the pavement once in a while and not your mouth on the mike forever. Chase all the pretty girls; that's alot more fun than chasing that there, whatever you call it, --- DX!!!! ---

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HEARD ABOUT DECIBELS --- BUT NEPERS??

Your old friend, Mr. Decibel, is old hat to all hams, but what is this new unit called Nepers? Maybe some of you never heard of nepers even yet. Well, it's a unit that was probably invented by our well known genius, Msr. Napier. We all know how names get butchered. Just look over your old family graveyard for some surprises if you haven't already discovered this fact. Now, to the point. Exactly what does one neper equal? Well, one neper equals 8.686 decibels, and it is equivalent to a loss of 36.8%. Now that's a familiar number -- .368. Yes, that is the percentage of charge lost by a capacitor after one time constant. This .368 also equals the value of the constant e to the negative unity power or exponent. This value also equals one neper. If you lose 36.8 volts from an input of 100 volts, you have lost one neper. See, all you need to know to get a degree in EE is to memorize .368!!!

Although we in the USA do not use the unit nepers, in Europe and some other countries, the neper is used rather than the dB. Thanks to reading the RARS EXCITER, you can adapt quite comfortably to an alien EE environment. You are indeed welcome! Guten Tag! Bonjour! Konichewa (sp?) !! Mabuhay!! es Gud DX Amigo!!!

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A BRAIN TEASER:

Three sailors were washed ashore on an island, and found a large pile of coconuts. They tried to divide the pile into three equal parts, but one coconut was left over. They went to sleep. During the night, a sailor arose, threw one coconut into the sea, took one-third of the remainder, and went back to sleep. The second sailor awoke, threw one coconut into the sea, took one third of the remainder, and went to sleep. The third sailor woke up, threw one coconut into the sea, took one third of the remainder, and went to sleep.

In the morning, the three sailors arose and found that there was only one coconut left when each took an equal share. They threw the odd coconut into the sea, leaving no coconuts remaining.

THE PUZZLE: What is the minimum number of coconuts in the original pile that satisfies the above. (NO SPLIT COCONUTS)

73, Bill N4AOP @ WA4TFZ
(answer in next month's EXCITER)

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REMEMBER THE RARS OUTGOING QSL BUREAU SERVICE!

If you are an ARRL member, bring your DX QSL cards to the meeting with the mailing label from your current issue of QST. John, KK4JB, will collect the cards and bulk mail them all to the ARRL outgoing bureau. ARRL bureau rules apply.

In February, 3 members submitted 32 cards to the bureau's service.

AMATEUR RADIO - A NATIONAL RESOURCE

RALEIGH AMATEUR RADIO SOCIETY, INC.
P. O. BOX 17124
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SPECIAL SERVICE CLUB

RARS meets each first Wednesday, 7:30 PM at First Presbyterian Church, 111 W. Morgan Street
RARS Nets: Nightly at 8:00 PM on 146.04/64; Mon., Tue., Thur., & Fri. at 8:30 PM on 28.364

Calendar

MARCH 1988

MAR 02 RARS Annual Awards Banquet, Ballantine's Cafeteria, 6:30 pm

MAR 09 Hamfest Comm. Meeting Place to be announced

MAR 16 RARS Advisory Board Mtg. 7:30 pm NCSU Faculty Club ALL Members Welcome !!

MAR 19,20 Charlotte, NC Hamfest

MAR 26,27 CQ WW Prefix Contest, ph.

APR 10 Annual RARS Hamfest: Pre reg. with AA4MY for FCC Exams; CW Contest - K4MC HOMEBREW Contest - WA9SZL

APR 30-1 Dayton Hamvention, OH

MAY 14 Durham, NC Hamfest